REMARKS/ARGUMENTS

Claims 8-27 are pending.

Applicants note with appreciation the indicated allowability of claims 16-27.

Claims 8-15 stand rejected under 35 USC §102(e) as being anticipated by Miki (U.S. Patent No. 6,268,618). This rejection is respectfully traversed and reconsideration is respectfully requested.

Applicant has amended independent claim 8 to more clearly identify a novel aspect of the present invention. Specifically, claim 8 has been amended to recite both the p-type semiconductor oxide and the metal of the ohmic contact **directly connect** to the p-type semiconductor material. It is respectfully submitted that this is supported by at least Figure 1 of the present application.

With reference to Figure 1, page 4, lines 20-23 of the present application, a film including a transition metal and a noble metal is deposited on a p-type GaN substrate (10). By performing heat treatment in an oxidizing environment, the transition metal is oxidized to form a p-type semiconductor oxide (12), wherein the film is a composite structure of the p-type semiconductor oxide (12) and the noble metal (14). It is respectfully submitted that, according to Figure 1, both the p-type semiconductor oxide (12) and the noble metal (14) **directly connect to** the p-type GaN substrate (10). In contrast thereto, the semiconductor oxide **does not directly connect to** the p-type substrate according to the cited reference (PN 6,268,618). According to the present invention, a much lower interface resistivity of 1.0×10^{-4} Ω-cm^2 may thus be obtained.

Miki teaches a light-permeable electrode (11) consisting of a first layer (11a) of a light permeable metal formed on the surface of the p-type GaN layer (30), and a second layer (11b) consisting of a light-permeable metal oxide formed on the first layer (11a). Also, Miki

uses X-ray diffraction (XRD) to find the first layer (11a/111a) is comprised of metal (Au), and the second layer (11b/111b) is comprised of NiO and a small amount of Ni. Due to the second layer (11b/111b) formed on the first layer (11a/111a), the NiO (referred to as semiconductor oxide) in the second layer (11b/111b) does not **directly** connect to the p-type GaN substrate (30) (see Figs. 1, 6-12 and 15-22 and Col. 16, lines 42-55 and Col. 18 lines 46-48 of PN 6,268,618.)

However, Miki does not anticipate claim 8 because it does not teach or suggest the ohmic contact comprising a layer of p-type semiconductor oxide and metal in a condition of mixed morphology, wherein both the p-type semiconductor oxide and the metal **directly** connect to the p-type semiconductor material.

Applicants respectfully emphasize that the function of the oxide layer of the present invention is different from that of the cited reference. The oxide of the present invention is semiconductor oxide, which helps carriers to penetrate the interface between the ohmic contact and the p-GaN substrate. Thus, a low specific contact resistance may be obtained. Nevertheless, referring to Col. 9, line 61 to Col. 10, line 3 and Col. 17, lines 13-14 of PN 6,268,618, the function of the metal oxide (11b) of the cited reference is to prevent the ball-up phenomenon from occurring in the first layer (11a) of metal, so as to increase adhesion therebetween. That is, referring to Col. 9, lines 11-21 of PN 6,268,618, the metal oxide (11b) of the cited reference could be semiconductor oxide (e.g. NiO, SnO, Cr_2O_3, CoO, ZnO, CuO_2, In_2O_3) or insulator (MgO). The metal oxide (11b) at the overlap/laminated portion of the bonding electrode is then removed (shown in Figs. 9, 10, 12, 15, 18, 20 and 22). As a result, both the structure and the oxide function according to the present invention and the cited reference are different.

Thus, the cited reference does not describe or suggest all the elements of the present invention as set forth in independent claim 8 of the present invention, and, as much, cannot anticipate these claims under 35 U.S.C. 102. Similarly, the prior art does not render the present invention obvious under 35 U.S.C 103, as there is no suggestion of both the p-type

semiconductor oxide and the metal being directly connected to the p-type semiconductor material.

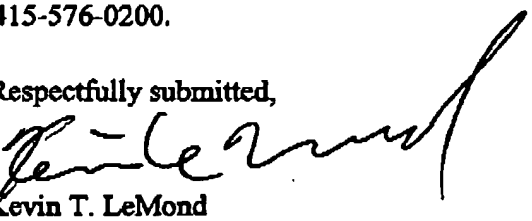
For the reasons mentioned above, Miki does not teach that both the p-type semiconductor oxide and the metal directly connect to the p-type semiconductor material. Accordingly, it is respectfully submitted that claim 8 is allowable over the cited art. Claims 9-14 depend from claim 8 and therefore, it is respectfully submitted that these claims are also allowable for at least the reasons claim 8 is allowable.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance and an action to that end is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,



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